CLAIMS

What is claimed is:

1. A method comprising:

using a liquid metal coolant in a liquid cooling system to cool a first electronic component in a computer system, wherein the liquid metal includes a freezing point property of at least -10 degrees Celsius.

2. The method of claim 1, wherein the liquid metal coolant includes a mixture of Indium and Gallium.

3. The method of claim 2, wherein the liquid metal coolant further includes other metallic elements.

4. The method of claim 3, wherein the other metallic elements includes one or more of zinc and copper.

5. The method of claim 1, further comprising:

using a pump to transport the liquid metal coolant in a tube toward or away from a heat exchanger.

6. The method of claim 5, wherein the heat exchanger is a remote heat exchanger (RHE).

7. The method of claim 5, wherein the RHE is a single-pass RHE.

8. The method of claim 5, wherein the RHE is a multi-pass RHE.

9. The method of claim 6, further comprising:
using a heat pipe to extract heat from a second electronic component in the computer system, wherein a condensation end of the heat pipe is cooled by the RHE.

10. The method of claim 1, wherein the first electronic component associated with a first cold plate

11. The method claim 10, further comprising:
using a heat spreader to extract heat from a third electronic component in the computer system, wherein the heat spreader is coupled to the first cold plate.

12. The method of claim 5, wherein the pump is an electro-magnetic pump.

13. The method of claim 5, wherein the pump is a mechanical pump.

14. The method of claim 1, further comprising:
using the liquid metal coolant to cool a fourth electronic component in the computer system, the fourth electronic component placed in series with the first electronic component.

15. The method of claim 1, further comprising:
using the liquid metal coolant to cool a fifth electronic component in the computer system, the fifth electronic component placed in parallel with the first electronic component.

16. An apparatus, comprising:

a heat exchanger; and

a pump coupled to the heat exchanger and is to enable a liquid metal coolant to flow in a tube toward the heat exchanger, wherein the liquid metal coolant is used to cool a first component in a computer system.

17. The apparatus of claim 16, wherein the pump is an electro-magnetic pump.

18. The apparatus of claim 16, wherein the heat exchanger is a single-pass heat exchanger.

19. The apparatus of claim 16, wherein the heat exchanger is a multi-pass heat exchanger.

20. The apparatus of claim 16, wherein the first component is associated with a first cold plate.

21. The apparatus of claim 20, wherein the liquid metal coolant is further used to cool a second component in the computer system, the second component associated with a second cold plate, wherein the pump is to enable the liquid metal coolant to flow in the tube from the first cold plate to the second cold plate in series.

22. The apparatus of claim 20, wherein the liquid metal coolant is further used to cool a third component in the computer system, the third component associated with a third cold plate, wherein the pump is to enable the liquid metal coolant to flow in the tube to the first cold plate and to the third cold plate in parallel.

23. The apparatus of claim 20, further comprising:

a heat spreader coupled to a fourth component to transfer heat generated by the fourth component, wherein the heat spreader is coupled to the first cold plate.

24. The apparatus of claim 16, further comprising:

a heat pipe coupled to a fifth component to transfer heat generated by the fifth component, wherein a condensation end of the heat pipe is cooled the heat exchanger.

25. The apparatus of claim 16, wherein the liquid metal includes a freezing point property of at least -10 degrees Celsius

26. A system, comprising:

a first electronic component;

a remote heat exchanger (RHE) coupled to the first electronic component; and

a pump coupled to the first electronic component and to the RHE, the

pump is to enable a liquid metal coolant to flow toward and away from the RHE.

27. The system of claim 26, wherein the liquid metal coolant is to flow toward and away from the RHE in a tube.

28. The system of claim 26, wherein the liquid metal coolant includes a freezing property of at least -10 degrees Celsius.

29. The system of claim 26, further comprising:
a second electronic component coupled to the RHE, wherein the liquid metal coolant is to extract heat from the first electronic component and from the second electronic component in series.

30. The system of claim 26, further comprising:
a third electronic component coupled to the RHE, wherein the liquid metal coolant is to extract heat from the first electronic component and from the third electronic component in parallel.

31. The system of claim 26, further comprising:
a fourth electronic component coupled to a heat pipe to extract heat generated by the fourth electronic component, wherein vapor in the heat pipe is condensed into a working liquid by the RHE.

32. The system of claim 26, further comprising:
a fifth electronic component coupled to a heat spreader to extract heat generated by the fifth electronic component, wherein the heat spreader is further coupled to the first electronic component.

33. The system of claim 26, wherein the liquid metal coolant includes a mixture of Indium and Gallium.

34. The system of claim 33, wherein the liquid metal coolant further includes other metallic elements.

35. The system of claim 34, wherein the other metallic elements includes at least one of zinc and copper.

36. The system of claim 26, wherein the RHE is a single-pass RHE or a multi-pass RHE.

37. The system of claim 26, wherein the pump is an electro-magnetic pump or a mechanical pump.

38. The system of claim 26, wherein the first electronic component is a processor or a graphics controller.

39. A method, comprising:

evacuating air from a loop used in a liquid cooling system to cool an electronic component in a system; and

filling the loop with a liquid metal coolant after the air is evacuated from the loop, wherein the liquid metal coolant is filled from a coolant container storing the liquid metal coolant at atmospheric pressure.

40. The method of claim 39, wherein a vacuum pump is used to evacuate the air from the loop.

41. The method of claim 40, wherein evacuating the air from the loop further comprises opening an air valve to enable the air to be evacuated from the loop by the vacuum pump, and closing the air valve after the air is sufficiently evacuated from the loop.

42. The method of claim 41, wherein the air is sufficiently evacuated from the loop when the air pressure in the loop is measured at less then 1 Torr.

43. The method of claim 41, wherein filling the loop comprises:
after the air is sufficiently evacuated from the loop, opening a coolant valve to fill the loop with the liquid metal coolant, and closing the coolant valve when the loop is completely filled with the liquid metal coolant.

44. The method of claim 39, wherein the loop includes one or more sections of tubes which are not heat pipes.